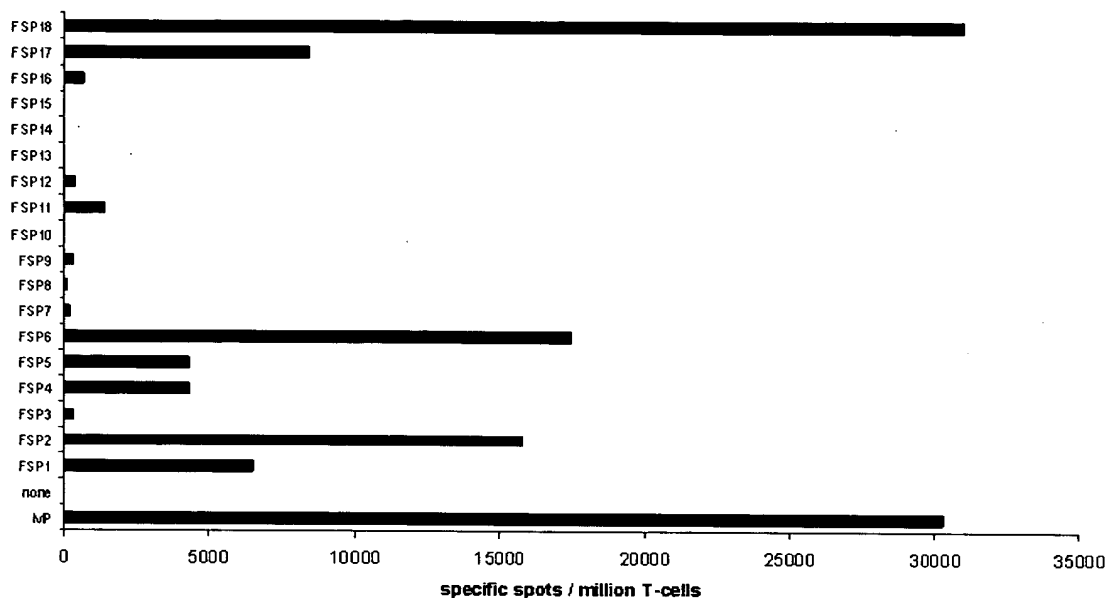
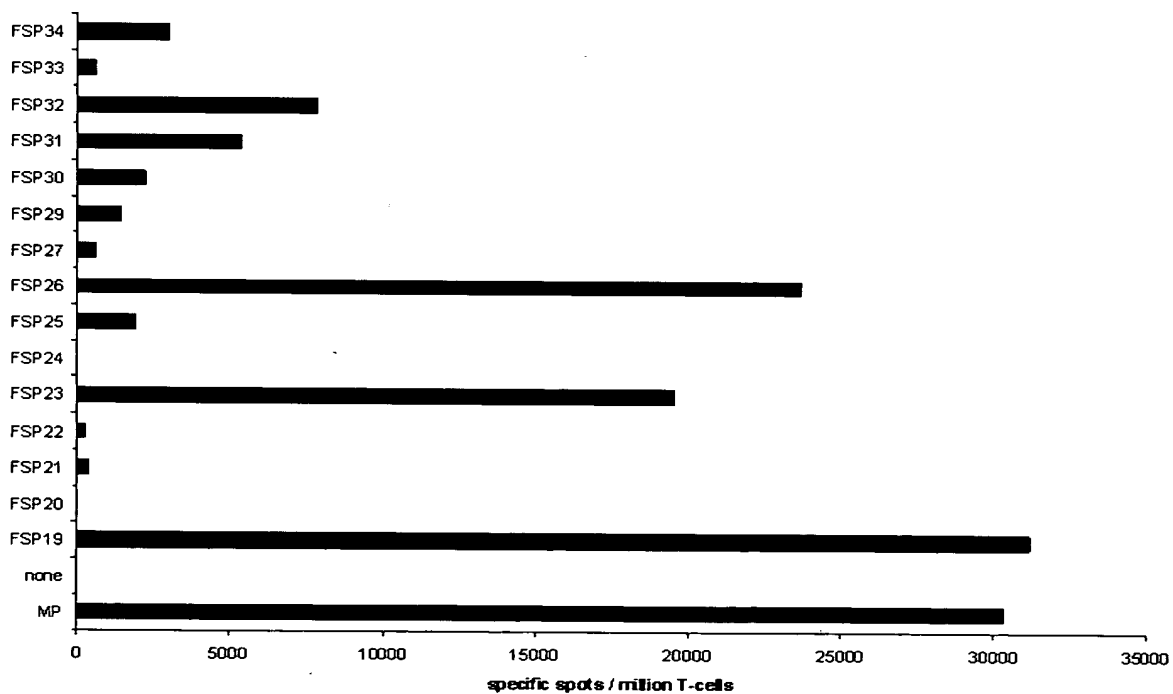


FIG.1

ELISpot analysis of FSP01 to FSP18



ELISpot analysis of FSP19 to FSP34



BEST AVAILABLE COPY

FIG. 2-2

MGAQFSKTAAGKGEAAERPGEEAAVASSPSKANGQENGHVKNVDASPAASGAKEELQANGSAPAADKEEPAAGSGAASPSS
AEKGEPAAAAPEAGASPVKEAPAEGEAAEPGSATAEAGEAASASSTSSPKAEDGATPSPSNETPKKK(K)EALFLQEVFAERL
LLQEEQEGGWRRR

TCF-4

(wt)ORF

MPQLNGGGGDDLGADELISFKDEGEQEEKSSENSAERDLADVKSLLVNESETNQNSSDSEAERRPPRSESFDRKSRESLEE
AKRQDGGGLFKGPPYPGYPFIMIPDLTSPYLPNGSLSPARTYLQMKWPLLDVQAGSLQSRQALKDARSPSPAHIVSNKVPVQHPHH
VHPLTPLITYSNEHFTPGNPPPHLPADVDPKTGIPRPPHPPDISPYPLSPGTVGQIPHPLGWLVPQQGQPVYPITGGFRHPYPTALT
VNASVSFRPPHMPVPPHHTLHTTGIPHPAIVTPTVKQESSQSDVGSLSHSSKHQDSKKEEEKKKPHIKPLNAFMLYMKEMRAKVAEC
TLKESAAINQILGRRWHALSREEQAKYYELARKERQLHMQLYPGWSARDNYGKKKKRKRDKQPGETNEHSECFLNPCLSLPPITDLS
APKKCRARFGLDQQNNWCGPCRRKKCVRYIQGEGSCLSPSSDGSLLDPPSPNLLGSPPRDAKSQTEQTQPLSLSLKPDPLAH
LSMMPPPPALLAEATHKASALCPNGALDLPALQPAAPSSSIQAPSTWSLHSHSLAGTQPQLSLVTKSLE

(-1)ORF

MPQLNGGGGDDLGADELISFKDEGEQEEKSSENSAERDLADVKSLLVNESETNQNSSDSEAERRPPRSESFDRKSRESLEE
AKRQDGGGLFKGPPYPGYPFIMIPDLTSPYLPNGSLSPARTYLQMKWPLLDVQAGSLQSRQALKDARSPSPAHIVSNKVPVQHPHH
VHPLTPLITYSNEHFTPGNPPPHLPADVDPKTGIPRPPHPPDISPYPLSPGTVGQIPHPLGWLVPQQGQPVYPITGGFRHPYPTALT
VNASVSFRPPHMPVPPHHTLHTTGIPHPAIVTPTVKQESSQSDVGSLSHSSKHQDSKKEEEKKKPHIKPLNAFMLYMKEMRAKVAEC
TLKESAAINQILGRRWHALSREEQAKYYELARKERQLHMQLYPGWSARDNYGKKKKRKRDKQPGETNEHSECFLNPCLSLPPITDLS
APKKCRARFGLDQQNNWCGPCRRKK(SAFATYKVKAAASAHPLQMEAY

(+) / (-2)ORF

MPQLNGGGGDDLGADELISFKDEGEQEEKSSENSAERDLADVKSLLVNESETNQNSSDSEAERRPPRSESFDRKSRESLEE
AKRQDGGGLFKGPPYPGYPFIMIPDLTSPYLPNGSLSPARTYLQMKWPLLDVQAGSLQSRQALKDARSPSPAHIVSNKVPVQHPHH
VHPLTPLITYSNEHFTPGNPPPHLPADVDPKTGIPRPPHPPDISPYPLSPGTVGQIPHPLGWLVPQQGQPVYPITGGFRHPYPTALT
VNASVSFRPPHMPVPPHHTLHTTGIPHPAIVTPTVKQESSQSDVGSLSHSSKHQDSKKEEEKKKPHIKPLNAFMLYMKEMRAKVAEC
TLKESAAINQILGRRWHALSREEQAKYYELARKERQLHMQLYPGWSARDNYGKKKKRKRDKQPGETNEHSECFLNPCLSLPPITDLS
APKKCRARFGLDQQNNWCGPCRRKK(K)VRS LHTR

TAF1b

(wt)ORF

IPAFPAAGTVLQPFPEAALATRVTPAVEAPAAPRLDLEEESEEFKERCTQCAAVSWGLTDEGKYCTSCHNVTERYQEVNTNDLIPNT
QIKALNRGLKKKNTEKGDWVYCEGFQYILYQQAELKNLGVPELKNLNDVHNFWKRYLQKSKQAYCKNPVYTTGRKPTVLEDNL
SHSDWASEPELLSDVSCPPFLESQSDIHRKPPFVPSKASQSETSVCSGLDGEYSQRKEKGIVKMTMPQTAFCYLSLLWQ
REAITLSDLLRFVEEDHIPYINAFQHFPEQMKLYGRDRGIFGIESWPDYEDYKKTIEVGTFLDLPRFPDITEDCYLHPNLCMKYLMV
LPDEMHSILTCHVVKMTGMGEVDFTFDPIAKMAKAVKYDVQAVIAIVVVLKLLFLMDDSEFWLSNLAEKHNEKNKDKPWFDFR
YQIMKKADEKKQKWEERAKYLWKSEKPLYSFVDKPVAYKKREMVNLQKQFSTLVDSTATAGKSPSSQFNWTEEDTDRCT
FHGHSLOQVLEKEGQSLLTKNSLYWLSTQKFCRW

(-1)ORF

IPAFPAAGTVLQPFPEAALATRVTPAVEAPAAPRLDLEEESEEFKERCTQCAAVSWGLTDEGKYCTSCHNVTERYQEVNTNDLIPNT
QIKALNRGLKKKTILKKAGIGMCVKVSSIFFINKQKP

(+) / (-2)ORF

IPAFPAAGTVLQPFPEAALATRVTPAVEAPAAPRLDLEEESEEFKERCTQCAAVSWGLTDEGKYCTSCHNVTERYQEVNTNDLIPNT
QIKALNRGLKKK(K)QY

AC-1

(wt)ORF

MDTQKQIHKTHNSKNQFFTIFFLSVEFGKEGTRKNFYLLSIGHYGRKSRRADLTADTADKTEPECFAASWTFDPNPSVTVSGAHS
TAVHQ

(-1)ORF

MDTQKQIHKTHNSKNQFFTIFFSCQLNLGRKEHAKIFTFFFQLDTMDGNPGELELQTLQIKQSQNALLPAGPLTQTPV

(+) / (-2)ORF

MDTQKQIHKTHNSKNQFFTIFF(F)PVS

Sec63

(wt)ORF

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVVGRCMWYRLRLKQPQNIPTVKKIVLAGWALFLFL
AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLSLKYHPDKGGDEVFMFRIAKAYAALDEESRKNWEEFGNPDGPQATSF
GIALPAWIVDQKNSILVLLVYGLAFMVLVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT
SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSHLARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREERFR
APTLASLENCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFLEDEKYEVMVAVLGSFPY
VTMDIKSQVLDDSDNNITVGSVTVLVKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQKSKGPKKTAKSKKK
PLKKKPTPVLLPQSQKQKQKQANGVVGNEAAVKEDEEVSDKSDSEEEETNRDSQSEKDDGSDRSDREQDEKQNKDDEAEW
QELQSQIRKERALLETKSKITHPVYSLYFPEEKQEWVWLYIADRKEQTLISMPYHVCTLKDTTEEVLEKFPAGKPGNYQYTVFLRSD
SYMGLDQIKPLKLEVHAKPVENHPQWDTAIEGDEDEQDESEGFEDSFEEDDDDD

(-1) 9er A-Repeat

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVVGRCMWYRLRLKQPQNIPTVKKIVLAGWALFLFL
AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLSLKYHPDKGGDEVFMFRIAKAYAALDEESRKNWEEFGNPDGPQATSF
GIALPAWIVDQKNSILVLLVYGLAFMVLVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT
SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSHLARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREERFR
APTLASLENCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFLEDEKYEVMVAVLGSFPY
VTMDIKSQVLDDSDNNITVGSVTVLVKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQKSKGPKKTAKSKKR
L

FIG. 2-3

(+1)/(-2) 9er A-Repeat

MAGQQFQYDDSGNTFFYFLTSFVGLVIVPATYYLWPRDQNAEQIRLKNIRKVVYGRCMWYRLRLKQPNIPTVKKIVLLAGWALFLFL
 AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF
 GIALPAWIVDQKNSILVLLVYGLAFMVILPVVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLAGESEFDPQYNKDAT
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLLSHLARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR
 APTLASLENCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIQTIDLVSLKESDRHTLLHFLEDEKEYEEMAVLGSFPY
 VTMDIKSQVLDDSDSNITVGSVTVLVKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQ
 KSKGPKTKAKSKK(K)ETFKKTYTCAITTVKATETKAGKWSRWE

(-1) 10er A-Repeat

MAGQQFQYDDSGNTFFYFLTSFVGLVIVPATYYLWPRDQNAEQIRLKNIRKVVYGRCMWYRLRLKQPNIPTVKKIVLLAGWALFLFL
 AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF
 GIALPAWIVDQKNSILVLLVYGLAFMVILPVVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLAGESEFDPQYNKDAT
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLLSHLARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR
 APTLASLENCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIQTIDLVSLKESDRHTLLHFLEDEKEYEEMAVLGSFPY
 VTMDIKSQVLDDSDSNITVGSVTVLVKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQ
 KSKGPKTKAKSKKKPLKKNLHLCYYHSQSNRNKSRQMESLGMKLQ

(+1)/(-2) 10er A-Repeat

MAGQQFQYDDSGNTFFYFLTSFVGLVIVPATYYLWPRDQNAEQIRLKNIRKVVYGRCMWYRLRLKQPNIPTVKKIVLLAGWALFLFL
 AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF
 GIALPAWIVDQKNSILVLLVYGLAFMVILPVVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLAGESEFDPQYNKDAT
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLLSHLARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR
 APTLASLENCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIQTIDLVSLKESDRHTLLHFLEDEKEYEEMAVLGSFPY
 VTMDIKSQVLDDSDSNITVGSVTVLVKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQ
 KSKGPKTKAKSKKKPLKK(K)TYTCAITTVKATETKAGKWSRWE

Caspase 5**(wt)ORF**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLPNTDQKSTSVKKNHKKTKVMLEYLGDVHLGVFNYLAKHDVLTKEEEKKKYY
 DAKIEDKALILVDSLKRNVAHQMFTQTLLNMDQKITSVKPLQIEAGPPESAESTNILKCPREEFLRLCKKNHDEIYPPIKKREDRRRLA
 LIICNTKFDHLPARNGAHYDIVGMKRLQGLGYTVVDEKNLTARDMESVLRFAARPEHKSSDSTFLVLMHSGILEGICGTAHKKKKPD
 VLLYDTIFQIFNNRNCLSLKDQPKVIVQACRGEKHGELWVRDSPASLAVISSQSENLEADSVCKIHEEKDFIAFCSSSTPHNVSWRDR
 TRGSIFITELTCFQKYSCCCHLMEIFRKVQKSFEVPOAKAQMP TIERATLTRDFYLFPGN

(-1)ORF

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLPNTDQKSTSVKKNHKKKQLRCWNTWAKMFFMVFLIWWQNTMF

(+1)/(-2)ORF

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLPNTDQKSTSVKKNHKK(K)NS

AIM2**(wt)ORF**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNMYLLAKRLQEEKEKVDKQ
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKPEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF
 HATVATEKEFFVVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV
 VQKVTEKKKNILFDLSDNTGKMEVLGVRNEDTMCKKEGDKVRLTFTLSKNGEKLQLTSGVHSTIKVIKAKKKT

(-1)ORF

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNMYLLAKRLQEEKEKVDKQ
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKPEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF
 HATVATEKEFFVVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV
 VQKVTEKKKNILFDLSDNTGKMEVLGVRNEDTMCKKEGDKVRLTFTLSKNGEKLQLTSGVHSTIKVIKAKKKHREVKRTNSSQLV

(+1)/(-2)ORF

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNMYLLAKRLQEEKEKVDKQ
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKPEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF
 HATVATEKEFFVVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV
 VQKVTEKKKNILFDLSDNTGKMEVLGVRNEDTMCKKEGDKVRLTFTLSKNGEKLQLTSGVHSTIKVIKAKK(K)NIEK

SLC23A1**(wt)ORF**

MMGIGKNTTSKSMAGSSTEGKYEDEAKHPAFFTLPVVINGGATSSGEQDNEDELMAYTTENGIAEKSSLAETLDSTGSLDPQRS
 DMIYTIEDVPPWYLCIFLGLQHYLTCSGTIAVPFLADAMCVGYDQWATSQIGTIFFCVGITTLLQTTFGCRLPLFQTSAFAPLAPARA
 ILSLDKWKCNTTDDVSANGTAELLHTEHIWYPRIREIQGAIMSSLIEVVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILAILVSWLLCFIFTVDVFPDPSTKYGFYARTDARQGVLLVAPW
 FKVPYPFQWGLPTVSAAGVIGMLSAAVVASIESIGDYACARLSCAPPPPIHAINRGIFVEGLSCVLDGIFGTGNGSTSSSPNIGVLGITK
 VGSRRVIQCGAALMLALGMIGKFSALFASLPDPVLGALFCTLFMITAVGLSNLQFIDLNSSRNFLVLFGSIFFGVLVPSYLRQNPLVTGI
 TGIDQVLNVLTTAMFVGGCVAFILDNTIPGTPEERGIRKWKKGVGKGNKSLDGMEYNLPGFMNIIKKYRCFSYLPISPSTFVGYTWK
 GLRKSNDNSRSDSDSQATG

(-1)ORF

MMGIGKNTTSKSMAGSSTEGKYEDEAKHPAFFTLPVVINGGATSSGEQDNEDELMAYTTENGIAEKSSLAETLDSTGSLDPQRS
 DMIYTIEDVPPWYLCIFLGLQHYLTCSGTIAVPFLADAMCVGYDQWATSQIGTIFFCVGITTLLQTTFGCRLPLFQTSAFAPLAPARA
 ILSLDKWKCNTTDDVSANGTAELLHTEHIWYPRIREIQGAIMSSLIEVVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILAILVSWLLCFIFTVDVFPDPSTKYGFYARTDARQGVLLVAPW
 FKVPYPFQWGLPTVSAAGVIGMLSAAVVASIESIGDYACARLSCAPPPPSSTQ

(+1)/(-2)ORF

FIG. 2-4

MMGIGKNTTSKSMEAGSSTEGKYEDEAKHPAFFTLPVWINGGATSSGEQDNEDTELMAYTTENGIAEKSSLAETLDSTGSLDPQRS
 DMIYTIEDVPPWYLCIFLGLQHYLTCSGTIAVPFLADAMCVGYDQWATSQILGTTIFFCVGITLLQTTFGCRLPLFQTSAAFLAPARA
 ILSLDKWCNTTDSVANGTAELLHTEHIWYPRIREIQGAIMSSLIEVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILVSWLLCFITVTVDFPPDSTKYGFYARTDARQGVLLVAPW
 FKVPYFQWGLPTVSAAGVIGMLSAVVASIIIESIGDYYACARLSCAPP

(P)HPRNKQGNFRGRPLLC

ABC1

(wt)ORF

MPKAPKQPPPEWIGDGESTSPSDKVVKKGKDKKIKKTFFELAVEDKQAGEEEKVLKEKEQQQQQQQQQKKRDRTRKGRR
 KKDVEDDGEELMERLKKLSVPTSDEEDEVPAKPRGGKTKGGNVFAALIQDQSEEEEEEEKHPPKPAKPEKNRINKAVSEEQQ
 PALKGKKGKEEKSQKAKPQNKFAALDNEEDKEEEIIEKEPPKQGGKEKAKKAEQMEYERQVASLKAANAENDFSVQAEMSSR
 QAMLENASDIKLEKFSISAHGKELFVNADLYIVAGRRYGLVGPNGKGKTTLLKHIANRALSIPPNDVLLCEQEVVADETPAVQAVLRAD
 TKRLKLEEEERRLQGGLEQGGDTAERLEKVEELRATGAAAAEAKARRILAGLGFDPQMNRPTQKFSGGWRMRVSLARALFMEP
 TLLMLDEPTNHLDLNAVWLNLYLQGWRTLLIVSHDQGLDDVCTDIHLDAQRLHYRGNYMTFKMYQQKQKELLKQYEQKQKLL
 KELKAGGKSTKQAEKQTKALTRKQKQKRRKNQDEESQAEPELLKRPKEYTVRFTFPDPPPLSPPVLGLHGVTFGYQQGKPLFKNL
 DFGIDMDSRICIVGPNVGKSTLLLLTGKLTPTHGEMRKNHRLKIGFFNQYAEQLRMEETPTTEYLQRGFNLPYQDARKCLGRFGL
 SHAHTIQICKLSGGQKARVFAELACREPDVILDEPTNNLDIESIDALGEAINEYKGAIVVSHDARLITETNCQLWVVEEQSVSQIDG
 DFEDYKREVLEALGEVMVSRPRE

(-1)ORF

MPKAPKQPPPEWIGDGESTSPSDKVVKKGKDKKIKKTFFELAVEDKQAGEEEKVLKEKEQQQQQQQQQKKSEIPEKAGGR
RMWMMMEKRKSSWSVLRSSQCQPMRRMKYPPQNPAEGRKPRVVMFLQP

(+1)/(-2)ORF

MPKAPKQPPPEWIGDGESTSPSDKVVKKGKDKKIKKTFFELAVEDKQAGEEEKVLKEKEQQQQQQQQQKK(K)ARYPKRQA
EEGCG

HSPC259

(wt)ORF

SPDYFPQISSQFGTVEK
 MEKIFISSSTKAEGKISPFEPINTQAPPEKGKEAVVQEPERSWFQTKEERKKEKIAKALQEFDLALRGKKRKKFMKDAKKKGEMT
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLFSICLKKKQKQKTTLCGGMVRSYFPHVCQSPFLLISFHMTIL
 NGSIFGKRE

(-1)ORF

MEKIFISSSTKAEGKISPFEPINTQAPPEKGKEAVVQEPERSWFQTKEERKKEKIAKALQEFDLALRGKKRKKFMKDAKKKGEMT
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLFSICLKKKKNKKQHFGVWVWVVAIFLSMSVNLPS

(+1)/(-2)ORF

MEKIFISSSTKAEGKISPFEPINTQAPPEKGKEAVVQEPERSWFQTKEERKKEKIAKALQEFDLALRGKKRKKFMKDAKKKGEMT
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLFSICLKK(K)TKTKNNTLVWVWYGT

Bax

(wt)ORF

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGGEAPELALDPVPQDASTKKLSECLKRIGDELDSNMELQRMIAAVDTD
 SPREVFRVAADMFSDGNFNWGRVVALFYFASKLVKALCTKVPPELIRTIMGWTLDFLRERLLGWIQDQGGWDGLLSYFGTPTWQT
 VTIFVAGVLTAASLTWKKMG

(-1)ORF

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGGRHPSWPWTRCLMRPPRS

(+1)/(-2)ORF

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGG(G)GTRAGPGPGASGCVHQAERVSQAHRGRTGQ

TCF6L1

(wt)ORF

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSEQLPIFKAQNPDAKTTELIRRIAQR
 WRELPSDKKKIYQDAYRAEWQVYKEEISRFKEQLTPSQIMSLEKEIMDKHLKRKAMTKKKELTLGKPKRPRSAYNVYVAERFQEAQ
 GDSPQEKLVKENWKNLSDSEKELYQHAKEDTRYHNEMKSWEQMIIEVGRKDLLRRTIKKQKRYGAEEC

(-1)ORF

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSEQLPIFKAQNPDAKTTELIRRIAQR
 WRELPSDKKKIYQDAYRAEWQVYKEEISRFKEQLTPSQIMSLEKEIMDKHLKRKAMTKKKS

(+1)/(-2)ORF

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSEQLPIFKAQNPDAKTTELIRRIAQR
 WRELPSDKKKIYQDAYRAEWQVYKEEISRFKEQLTPSQIMSLEKEIMDKHLKRKAMTKKK(K)RVNTAWTKTKTSFSL

FTL3L

(wt)ORF

MTVLAPAWSPPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSDYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT
 VAGSKMQGLLERVNTIEHFVTKCAFQPPPSCLRFVQTNISRLQETSEQLVALKPWITRONFSRCELCQCPDSSSTLPPWSPRPLE
 ATAPTAPQPLLLLLLLPVGLLLAAWCLHWQRTTRRTPRPGEQVPPVPSQDLLLLVEH

(-1)ORF

MTVLAPAWSPPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSDYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT
 VAGSKMQGLLERVNTIEHFVTKCAFQ
 PPPAVFASSRPTSPASCRPPSSWWR

FIG. 2-5

(+1)/(-2)ORF

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSDYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT
VAGSKMQGLLERVNTIEHFVTKCAFQPP(P)QLSSLRPDQHLPPAGDLRAAGGAELDHSPPELLVPGAAVSAR

OGT

(wt)ORF

MLQGHFWLVREGIMISPSSPPPNLFFFLQIFPFPFTSFPSHLLSLTPPKACYLKAIETQPNFAVAWSNLGCVFNAQGEIWLAIHFFE
KAVTLDPNFLDAYINLGNVLKEARIFDRAVAAYLRALSPPNHAVVHGNLACVYEEQGLIDLADTYRRRAIELQPHFPDAYCNLANALKE
KGSVAEAEEDCYNTALRLCPTHADSLNNLANIKREQGNIEEAVRLYRKALEVFPEFAAAHSNLSVLLQQQGLQEAALMHYKEAIRISPTF
ADAYSNMGNLTKEMQDVQALQCYTRAQINPAFADAHSNLSAIIKDSGNIPEAIAISYRTALKLPDFDAYCNLAHCLQIVCDWTDY
DERMKKLVSIADQLEKNRLPSVHPHSMYPLSHGFRKAIAERHGNLCLDKINVLHKPPYEHKDLKLSDGRLRVGYVSSDFGNHPT
SHLMQSIQGMHNPDKFEVFCYALSPDDGTNFRVKVMAEANHFDLSQIPCNKGAADRIHQDGIHILVNMNGYTKGARNELFALRPAPI
QAMWLGYPGTSGALFMDYIITDQETSPAIEVAEQYSEKLAYPEMPTFFIGDHANMFPHLKKKAVIDFKNNGHIYDNIRVLNGIDLKAFDLS
LPDVKIVKMKCPDGGDNADSSNTALNMPVIMNTIAEAVIEMINRGQIQITINGFSISNGLATTQINNKAATGEEVPRITIVTTSQYGLP
EDAIVYCNFNQLYKIDPSTLQMWANILKRVPNVSVLWLLRFPVAVGEPNIQYQAQNMGLPQNRIFSPVAPKEEHVRRGQLADVCLDTPL
CNGHTTGMDVLWAGTPMVTMPGETLASRVAASQLTCLGCELIANKRQEYEDIAVKLGTDELYLKKVRGKVKWKQRISPLFNTKQYT
MELERLYLQMWHEHYAAGNKPDHMIKPVEVTEA

(-1)ORF

MLQGHFWLVREGIMISPSSPPPNLFFSLYKFSFPFLPPFPPIFFH

(+1)/(-2)ORF

MLQGHFWLVREGIMISPSSPPPNLFF(F)PFTNFPLSLYLLSLPSSFINPS

ELAVL3

(wt)ORF

MESQVGGGPAGRAPRPLLTNGATDDSKTNLIVNYPQNMTQDEFKSLFGSIGDIESCKLVRDKITGQSLGYGFVNYSNDPNADKA
INTLNLGLKLTQTKIKVSYARPSSASIRDANLYVSGLPKTMQKEMEQLFSQYGRITSRLVDQVTGVSRGVGFIRFDKRIEAEAEIKGLN
GQKPLGAREPITVKFANNPSQKTGQALLTHLYQSSARRYAGPLHHQTQRFRDNLNLMAYAVKRFSPAIADGMSGLAGVGLSGGAAG
GWCIFYVNLSPEDQSVLWQLFGPGAVTNVKVIRDFTTNKCKGFGFMTMTNYDEAAMAIASLNGYRLGQRVLQVSFKTSKQHKHA

(-1)ORF

MESQVGGGARPA~~GLPN~~GHSLVQMEPLTARTSSSTTCPR

(+1)/(-2)ORF

MESQVGG(G)PGRPACPTATPWYKWSH

MAC30X

(wt)ORF

LFSHQRVQAQPTDYGGSFTRRCVWLLGLYFLSHIPITLMDLQAVVPRELYPVEFRNLLKWKYAKEFKDPLLQEPAPWFKSFLFCELV
FQLPFFPIATYAFKLGSKCWIRTPAIISVHTMTTLILILSTFLFEDFSKASGFGKQRPETLHERLTLVSVAAPYLLIPFILLIFMLRSPYKY
EEKRKKK

(-1)ORF

LFSHQRVQAQPTDYGGSFTRRCVWLLGLYFLSHIPITLMDLQAVVPRELYPVEFRNLLKWKYAKEFKDPLLQEPAPWFKSFLFCELV
FQLPFFPIATYAFKLGSKCWIRTPAIISVHTMTTLILILSTFLFEDFSKASGFGKQRPETLHERLTLVSVAAPYLLIPFILLIFMLRSPYKY
EEKRKKNEGNNHWPRVEMPTGWLLVGYIQEHCEPTSSAAFTLAAMHKSKMVSGMTSNPHLLPFFFF

(+1)/(-2)ORF

LFSHQRVQAQPTDYGGSFTRRCVWLLGLYFLSHIPITLMDLQAVVPRELYPVEFRNLLKWKYAKEFKDPLLQEPAPWFKSFLFCELV
FQLPFFPIATYAFKLGSKCWIRTPAIISVHTMTTLILILSTFLFEDFSKASGFGKQRPETLHERLTLVSVAAPYLLIPFILLIFMLRSPYKY
EEKRKK(K)MKETTTGPG

SLC4A3

(wt)ORF

MANGVIPIPPGGASPLQVRVPLEEPPLSPDVEEEDDDLGLTAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRTSHHHTHPLSA
RLPPPHKLRLPPTSARHTRRKRRKKEKTSAPPSEGTPPIQEEGGAGVDEEEEEEEEEGESEAEPEPPPSGTPQKAKFSIGSDEDD
SPGLPGRAAVTKPLPSVGPHTDKSPQHSSSSSPRARASRLAGEKSRWSPSASYDLRERLCPGSALGNPGGPEQQVPTDEAEAQ
MLGSADLDDMKSHRLEDNPGVRRHLVKKPSRTQGGGRGSPSGLAPILRRKKKKKLDRRPHEVFVELNELMLDRSQEPHWRETARW
IKFEEDVEEETERWGWKPHVASLSFRSLLELRRTIAHGAALLDLEQTTLPGLAHVVEVMIVSDQIRPEDRASVLRLLLLKHSHPNDDKDS
GFFPRNPSSSSMNSVLGNHHTPSHGPDPGAVPTMADDLGEPAWPHDPDAKEKPLHMPGGDGHGRKSLKLEKIPEDAEATVVL
VGCVPFLEQPAFAFVRLNEAVLLESVLEVPVVRFLVMLGPSHTSDYHELGRSIATLMSDKLFHEAAYQADDRQDLLSAISEFLDG
SIVIPPSEVEGRDRLRSVAAFQRELLRKRREREQTKVEMTTRGGYTAPGKELSLLEGGSEATPEDDPLLRGTGSVFGGLVRDVRRRYP
HYPDLRLDALHSQCVAALFIYFAALSPAIFGGLLGEKTEGLMGVSELIVSTAVLGVLSLLGAQPLLVGFGSGLLVFEEAFFKFCRA
QDLEYLTGRVWVGLWLVFVLAALVAAEGSLVRYISPTQEIFALISLIFYETFYKLYKVFTHEPLLPFYPEGALEGLSAGLEPNGS
ALPPTGPPSPRNQPNALLSLILMLGTFIAFFLRKFRNSRFLGGKARRIIGDFGIPISILVMVLVDYSITDITYTQKLTVPTGLSVTSPDK
RSWFIPPLGSARPPFPWMMVAAVALLVILIFMETQITALIVSQARRLLKSGFHLDLLIGSLGGLCGFLGPWLTAATVRSVTHV
NALTVMRTAIAPGDKPQIQEVREQRVTGVLIASLVGLSIVMGAVLRRIPAVLFGIFLYMGVTSLSGIQLSQRLLILMPAKHHPEQPYVT
KVKTWRMHLFTCIQLGCIALLWVVKSTAASLAFPLLLLTVPRLRHCLLPRLFQDRELQALDSEDAEPNFDGQDEYNELHMPV

(-1)ORF

MANGVIPIPPGGASPLQVRVPLEEPPLSPDVEEEDDDLGLTAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRTSHHHTHPLSA
RLPPPHKLRLPPTSARHTRRKRRKKEKTSAPPSEGTPPIQEEGGAGVDEEEEEEEEEGESEAEPEPPPQPHRRQSSPLEVTRM
TVQASLGLLSPSPCPRWAHTLTRAPSTPAAPPAGPGPPDSLGRKAGPGAHRPVMTCGSDCAQVPWATQVQSSRCQMRRR
PRCWVLQWTT

(+1)/(-2)ORF

MANGVIPIPPGGASPLQVRVPLEEPPLSPDVEEEDDDLGLTAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRTSHHHTHPLSA
RLPPPHKLRLPPTSARHTRRKRRKKEKTSAPPSEGTPPIQEEGGAGVDEEEEEEEEEGESEAEPEPP(P)LRDPTGKVLHWK

FIG. 2-6

PRKDC**(wt)ORF**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVLALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL
CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLLQTFRSSRLMDEFKIGELFSKFYGEALKKKIPDVTLEKVYELLGLL
GEVHPSEMINNAENLFAFLGELKTQMTSAVREPKLPLVLAGCLKGLSSLLCNFTKSMEEDPQTSREIFNFVLKAIRPQIDLKRYAVPSA
GLRLFALHASQFSTCLLDNYVSLFEVLLKWCATNVELKKAALSLESFLKQVSNMVAKNAEMHKNKLQYFMEQFYGIIRNVDSNNKE
LSAIRGYGLFAGPCKVINAKVDVDFMYVELIQRCCKQMFLTQTDTGDDRVYQMPFSLQSVASVLLYLDTPVEVYTPVLEHLVVMQIDSF
QYSPKMQLVCCRAIVKVFALAAGKPVLRNCISTVVHQGLIRCSKPVVLPKGPESSESEDHRASGEVTRGKWKVPTYKYDVLFRHLL
SSDQMMDSILADEAFFSVNSSSESLNHLLYDEFVKSVLKIVEKDLTLEIQTVEGEQENGDEAPGVWMIPTSDPAANLHPAKPKDFSAFI
NLVEFCREILPEKQAEFFEPWVYSFSYELILQSTRPLISGFYKLLSITVRNAKKIKYFEGS

(-1)ORF

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVLALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL
CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLLQTFRSSRLMDEFKIGELFSKFYGEALKKKYQ/QF

(+1)/(-2)ORF

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVLALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL
CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLLQTFRSSRLMDEFKIGELFSKFYGEALKK(K)NTRYSFRRKS/

UVRAG**(wt)ORF**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRRLRHLRNIAARNIVNRNGHQLLDYFTLHLCSTEKIYKEFYRSEVIKN
SLNPTWRSDFGIMPDRLDTSVSCFVVKIWGGKENIYQLLIEWKVCLDGLKYLQQIHAHARNQNEIIFGLNDGYGAPFEHKGYSNAQK
TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQKIGKEIEEKLRLTSTSNELKKKSECLQLKILVLQNELEKQKALGREVALLH
KQQIALQDKGSFAEHLKLQKESNELRKECTAKRELFLKTNAQLTIRCRQLLSELSYIYPIDLNEHKDYFVCGVKLPNSDFQAK
DDGSIavalGYTAHLVSMISFFLQVPLRYPIIHKGSRSSTIKDNINDKLETEKEREFLYPKGGEKLQFDYGVYLLKNIAQLRYQHGLGTP
DLRQTLPLNLKNFMEHGLMVRCDRHHTSSAIPVVKRQSSIFGGADVFGSGGIPSPDKGHRKRASSENERLQYKTPPPSYNSALAQPV
TVPSMGETERKITSLSLSDTSDFSKENKKKGEDLVGSLNGGHANVHPSQEQGEALSGHRATVNGTLLPSEQAGSASVQLPGEFH
PVSEALCCTVEQAEIIGLEAQVSPQVIS

(-1)ORF

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRRLRHLRNIAARNIVNRNGHQLLDYFTLHLCSTEKIYKEFYRSEVIKN
SLNPTWRSDFGIMPDRLDTSVSCFVVKIWGGKENIYQLLIEWKVCLDGLKYLQQIHAHARNQNEIIFGLNDGYGAPFEHKGYSNAQK
TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQKIGKEIEEKLRLTSTSNELKKKV/NACS

(+1)/(-2)ORF

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRRLRHLRNIAARNIVNRNGHQLLDYFTLHLCSTEKIYKEFYRSEVIKN
SLNPTWRSDFGIMPDRLDTSVSCFVVKIWGGKENIYQLLIEWKVCLDGLKYLQQIHAHARNQNEIIFGLNDGYGAPFEHKGYSNAQK
TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQKIGKEIEEKLRLTSTSNELKKK(K)

MSH3**(wt)ORF**

MSRRKPASGGLAASSAPARQAVLSRFFQSTGSLKTSSTGAADQVDPGAAAAAAAAAAAAAPPAPPAPAFPPLPPHVATEIDRR
KKRPLENDGPVKKVKKVQKQEGGSDLGMSGNSEPKKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVLPKCTDFDDI
SLLHAKNAVSSSEDSKRQINQKDTTLFDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG
EDAEIAARELNICHLDHNFMTASIPHRLFVHVRRLVAKGYKGVVVKQTETAALKAGIDNRSSLFSRKLALYTKSTLIGEDVNPLIKLD
DAVNVDEIMTDTSTSYLLCISENKENVRDKKGNIFIGVGPATGEVVFDSFQDSASRSELETRMSSLQPVELLPSALSEQTEALIH
RATSVSVQDDRRIVERMDNIYFEYSHAFQAVTEFYAKDVTDIKGSQIISGIVNLEKPVICSLAAIKYLKEFNLEKMLSKPENFKQLSSKM
EFMTINGTTLRNLEILQNQTDMMTKGSLWVLDHTKTSFGRRLKLVVTPQLLKLREINARLDVSEVLHSESSVFGQIENHLRKLPLDI
GRGLCSYIYHKKCSTQEFFLVKTLVHLKSEFQAIIPAVNSHIQSDLLRTVILEIPELLSPVEHYLKILNEQAQKVGDKTELFKDLSDFP
RKDEIQGVIDEIRMLHLEIRKILKNPSAQYTVSGQEFMIEIKNSAVSCIPTDWVKVGSTKAVSRFHSFPFIVENYRHLNQLREQLVDCS
AEWLDLEKFESEHYHSLCKAVHHLATVDCIFSLAKVAKQGDYCRPTVQEERKIVIKNGRHPVIDVLLGEQDQYVPNNTDLSEDSERVM
IITGPNMGKSSYIKQVALITIMAQIGSYVPAEEATIGVDGIFTRMGADNIYKGRSTFMEELTDATIEIRKATSQSLVILDELGRGTSTH
DGIAIAYATLEYFIRDVKSLLTFVTHYPPVCELEKNYSHQVGNHMGFLVSEDESKLDPGTAEQVDFVTFYQITRGIAARSYGLNVA
KLADVPGEILKKAHKSKELEGLINTKRRLKYFAKLWTHMNAQDLQKWTEEFNMEETQTSLLH

(-1)ORF

MSRRKPASGGLAASSAPARQAVLSRFFQSTGSLKTSSTGAADQVDPGAAAAAAAAAAAAAPPAPPAPAFPPLPPHVATEIDRR
KKRPLENDGPVKKVKKVQKQEGGSDLGMSGNSEPKKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVLPKCTDFDDI
SLLHAKNAVSSSEDSKRQINQKDTTLFDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG
EDAEIAARELNICHLDHNFMTASIPHRLFVHVRRLVAKGYKGVVVKQTETAALKAGIDNRSSLFSRKLALYTKSTLIGEDVNPLIKLD
DAVNVDEIMTDTSTSYLLCISENKENVRDKKRAFLFLLALWECSLQARCLIVSRTLLLVQS

(+1)/(-2)ORF

MSRRKPASGGLAASSAPARQAVLSRFFQSTGSLKTSSTGAADQVDPGAAAAAAAAAAAAAPPAPPAPAFPPLPPHVATEIDRR
KKRPLENDGPVKKVKKVQKQEGGSDLGMSGNSEPKKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVLPKCTDFDDI
SLLHAKNAVSSSEDSKRQINQKDTTLFDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG
EDAEIAARELNICHLDHNFMTASIPHRLFVHVRRLVAKGYKGVVVKQTETAALKAGIDNRSSLFSRKLALYTKSTLIGEDVNPLIKLD
DAVNVDEIMTDTSTSYLLCISENKENVRDKK(K)GQHFWHCGSAAACHRRGCV

ACVR2,**(wt) ORF**

MGAAAKLAF VFLISCSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL
DDINCYDRTD CVEKKDSPEV FYCCCEGNMC NEKFSYFPEM EVTQPTSNPV TPKPPYYNIL LYSVLPLMLI AGIVICAFWV

FIG. 2-7

YRHHKMAYPP VLVPTQDPGP PPPSPLLGLK PLQLLEVAKR GRFGCVWKAQ LLNEYVAVKI FPIQDKQSWQ NEYEVYSLPG
MKHENILQFI GAEKRGTSVD VDLWLITAFH EKGSLSDFLK ANVVSWNELC HIAETMARGL AYLEDIPGL KDGHKPAISH
RDIKSKNVLL KNNLTACIAD FGLALKFEAG KSAGDTHGQV GTRRYMAPEV LEGAINFORD AFLRIDMYAM GLVLWELASR
CTAADGPVDE YMLPFEEEIG QHPSLEDMQE VVVHKKRPV LRDYWQKHAG MAMLCETIEE CWDHDAEARL SAGCVGERIT
QMQLRTNIIT TEDIIVVTM VTNVDFFPKE SSL*

A8, Pos. 451: -1 ORF (Mut.rate 16.3%)

MGAAAKLAFV VFLISCSSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL
DDINCYDRDT CVEKKALKY IFVAVRAICV MKSFLIFRRW KSHSPLQIQL HLSHPITTSC SIPWCHLC*

A8 Pos. 1476: -1 (Mut.rate 81.6%)

MGAAAKLAFV VFLISCSSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL
DDINCYDRDT CVEKKDSPEV YFCCCEGNMC NEKFSYFPEM EVTQPTSNPV TPKPPYYNIL LYSVLPLMLI AGIVICAFVW
YRHHKMAYPP VLVPTQDPGP PPPSPLLGLK PLQLLEVAKR GRFGCVWKAQ LLNEYVAVKI FPIQDKQSWQ NEYEVYSLPG
MKHENILQFI GAEKRGTSVD VDLWLITAFH EKGSLSDFLK ANVVSWNELC HIAETMARGL AYLEDIPGL KDGHKPAISH
RDIKSKNVLL KNNLTACIAD FGLALKFEAG KSAGDTHGQV GTRRYMAPEV LEGAINFORD AFLRIDMYAM GLVLWELASR
CTAADGPVDE YMLPFEEEIG QHPSLEDMQE VVVHKKRGLF*

FLJ11053, A11 Pos. 1695, Mut.rate 52.2%

wt ORF

MVLRKLSKDD VTTKLKAMQE FGTMCETERDT ETVKGVLPYW PRIFCKISLD HRRRVREATQ QAFEKLTLLV KKQLAPYLKS
LMGYWLMAQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT
CSLLALKRLL CLLPDNEIDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAF ELVSALCQRI PQLMKEEASK VSPSVLLSID
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGQL FNHLAETLSS
WEAKADTEKD EKAHNLENV LIHFWERLSE ICVAKISEPE ADVESVLGVS NLLQVLQPKP SSLKSSKKKN GKVRFADEIL
ESNKENECV SSEGEKIEGW ELTTEPSLTH NSSGLLSPLR KPLEDLVCK LADISINYVN ERKSEQHLRF LSTLLDSFSS
SRVFKMLLD EKQSIQAKP LEIAKLQKN PAVQFLYQKL IGWLNEDQRK DFGFLVDILY SALRCCNDM

-1 ORF

MVLRKLSKDD VTTKLKAMQE FGTMCETERDT ETVKGVLPYW PRIFCKISLD HRRRVREATQ QAFEKLTLLV KKQLAPYLKS
LMGYWLMAQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT
CSLLALKRLL CLLPDNEIDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAF ELVSALCQRI PQLMKEEASK VSPSVLLSID
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGQL FNHLAETLSS
WEAKADTEKD EKAHNLENV LIHFWERLSE ICVAKISEPE ADVESVLGVS NLLQVLQPKP SSLKSSKKKM VRLDLLMRYL
KAIKRMKNVY LQKERRLKAG N*

-2 ORF

MVLRKLSKDD VTTKLKAMQE FGTMCETERDT ETVKGVLPYW PRIFCKISLD HRRRVREATQ QAFEKLTLLV KKQLAPYLKS
LMGYWLMAQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT
CSLLALKRLL CLLPDNEIDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAF ELVSALCQRI PQLMKEEASK VSPSVLLSID
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGQL FNHLAETLSS
WEAKADTEKD EKAHNLENV LIHFWERLSE ICVAKISEPE ADVESVLGVS NLLQVLQPKP SSLKSSKKK W*

+ 1 ORF

MVLRKLSKDD VTTKLKAMQE FGTMCETERDT ETVKGVLPYW PRIFCKISLD HRRRVREATQ QAFEKLTLLV KKQLAPYLKS
LMGYWLMAQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT
CSLLALKRLL CLLPDNEIDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAF ELVSALCQRI PQLMKEEASK VSPSVLLSID
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGQL FNHLAETLSS
WEAKADTEKD EKAHNLENV LIHFWERLSE ICVAKISEPE ADVESVLGVS NLLQVLQPKP SSLKSSKKK W*

KIAA1052, A11 Pos. 689, Mut.rate 42.2%

wt ORF

MAGRPLRIGD QLVLEEDYDE TYIPSEQIL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYFNFANG
QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKKEKKD KKDRDPKSS LALGSSAPV HVPLGGLAPL RGLVDTPPSA
LRGSQSVSLG SSVESGRQLG ELMPLSQGLK TSAYTKGLL SIYEDKTALS LLGLEETNE EDEEESDNQS VHSSEPLRN
LHLDIGALGG DFEYEESLRT SQPEEKDVS LQSDAAGPPT PCKPSSPGAD SSLSSAVGKG RQSGARPGL PEKEENEKSE
PKICRNLVTP KADPTGSEPA KASEKEAPED TVDAGEEGR REEAAKEPKK KASALEEGSS DASQELEISE HMKEPQLSDS
IASDPKSFHG LDFGFRSRIE EHLDDVDLS PVLGGACRQA QQLGIEDKD DSQSSQDELQ SKQSKGLEER YHRLSPPLPH
EERAQSPPRS LATEEPPQG PEGQPEWKEA EELGEDSAAS LSLQLSLQRE QAPSPPAACE KGKEQHSQAE ELGPGEQEA
DPEEKVAVSP TPPVSPVRS TEPVAPPEQL SEAALKAMEE AVAQVLEQDQ RHLLSKQEK MQQLREKLCQ EEEEEILRLH
QQKEQSSSL RERLQKAIIE EEARMREES QRLSWLRAQV QSSTQADEQ IRAEQEASLQ KLREELESQ KAERASLEQK

FIG. 2-8

NRQMLEQLKE EIEASEKSEQ AALNAAKEKA LQQLREQLEG ERKEAVATLE KEHSAELERL CSSLEAKHRE VVSSLQKKIQ
 EAQQKEEAQL QKCLGQVEHR VHQKSYHVAG YEHELSSLLR EKRQEVEGEH ERRLDKMKEE HQQVMAKARE QYEAERKQR
 AELLGHLTGE LERLQRAHER ELETVRQEQH KRLEDLRRRH REQERKLQDL ELDLETRAKD VKARLALLEV QEETARREKQ
 QLLDVQRQVA LKSEEATATH QQLEEAQKEH THLLQSNQQL REILDELQAR KKLKESQVDL LQAQSQQLQK HFSSLEAEAQ
 KKQHLLREVT VEENNAPPHF EPDLHIEDLR KSLGTNQTKE VSSSLSQSKE DLYLDSLSSH NVWHLLSAEG VALRSAKEFL
 VQQTRSMRRR QTALKAAQGH WRHELASAE VAKDPPGIKA LEDMRKNLEK ETRHLDKMS AMRKGHNLLK KKEEKLNLQLE
 SSLWEEASDE GTLGGSPKK AVTFDLSMD SLSSSESSEF SPPHLDSTPS LTRKIHGLS HSLRQISSQL SSVLSILDSL
 NPQSPPLLA SMPAQLPPRD PKSTPTPTYY GSLARFSALS SATPTSTQWA WDSGQGPRLP SSVAQTVDDF LLEKWRKYFP
 SGIPLLSNP TPLESRLGYM SASEQLRLQ HSHSQVPEAG STTFQGIIEA NRRWLERVKN DPRLPLFSST PKPKATLSLL
 QLGLDEHNRV KVYRF*

- 1 ORF

MAGRPLRIGD QLVLEEDYDE TYIPSEQEIL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYNFANG
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKRRKT RRTETPPKVR WPWVPH*

- 2ORF

MAGRPLRIGD QLVLEEDYDE TYIPSEQEIL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYNFANG
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKGKERQ EGQRPPQKFA GLGFLISPSS CSSWGPFSFT RSCGYPTLCS
SWISKREPGE LSGVWTSARW THAAFTGSQD LCLYKGSGLHI*

+ 1 ORF

MAGRPLRIGD QLVLEEDYDE TYIPSEQEIL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYNFANG
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKGKER QEGQRPPQKF AGLGFLISPS SCSSWGPFSF TRSCGYPTLC
SSWISKREPG ELSGVWTSARW RTHAAFTGSQ DLCLYKGSGLHI*

FIG. 3
FSP02

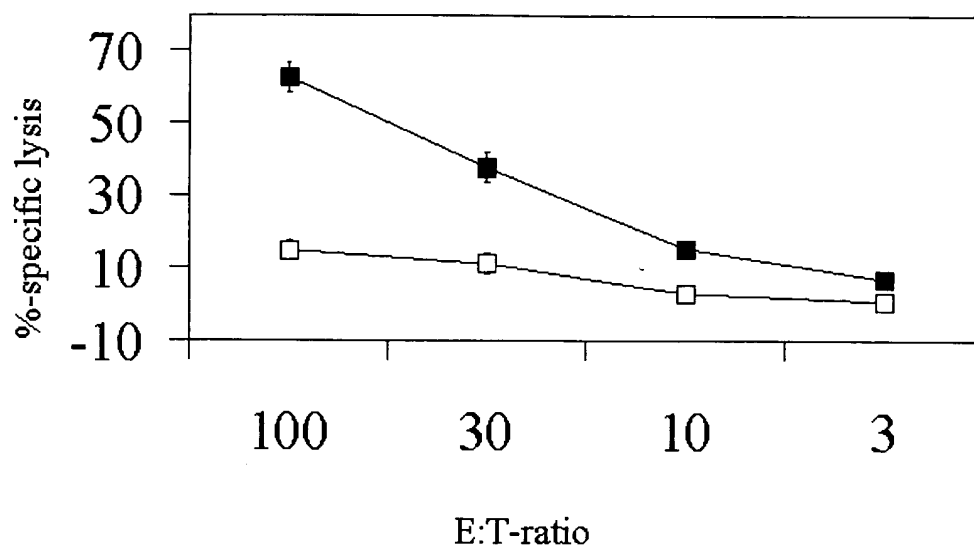
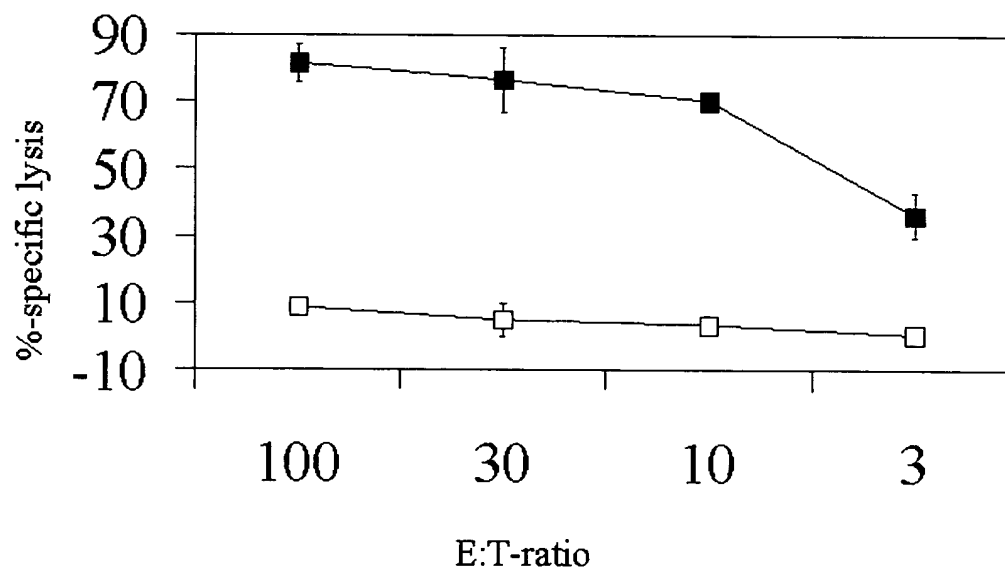


Figure 4

FSP06



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